

FORM PTO-1390 (Modified)  
(REV 11-98)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

## TRANSMITTAL LETTER TO THE UNITED STATES

293.000218

DESIGNATED/ELECTED OFFICE (DO/EO/US)

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

CONCERNING A FILING UNDER 35 U.S.C. 371

unknown 09/600208

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/DE99/00062

14-January-1999

14-January-1998

TITLE OF INVENTION

OPTICAL ARRANGEMENT IN THE ILLUMINATION BEAM PATH OF A MICROSCOPE

APPLICANT(S) FOR DO/EO/US

Johann ENGELHARDT; Heinrich ULRICH

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

## Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☒ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

Acknowledgement postcard

Express Mail Label No. EL628755847US

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 1.53) <b>09/600208</b>	INTERNATIONAL APPLICATION NO. <b>PCT/DE99/00062</b>	ATTORNEY'S DOCKET NUMBER <b>293.000218</b>
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21. The following fees are submitted:

CALCULATIONS PTO USE ONLY

**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :**

- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... **\$970.00**
- ☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO ..... **\$840.00**
- ☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... **\$690.00**
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... **\$670.00**
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) ..... **\$96.00**

**ENTER APPROPRIATE BASIC FEE AMOUNT =****\$840.00**Surcharge of **\$130.00** for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)). ☐ 20 ☐ 30**\$0.00**

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	23 - 20 =	3	x \$18.00	<b>\$54.00</b>	
Independent claims	1 - 3 =	0	x \$78.00	<b>\$0.00</b>	
Multiple Dependent Claims (check if applicable). <input type="checkbox"/>				<b>\$0.00</b>	

**TOTAL OF ABOVE CALCULATIONS =****\$894.00**Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable). ☐**\$0.00****SUBTOTAL =****\$894.00**Processing fee of **\$130.00** for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)). ☐ 20 ☐ 30 +**\$0.00****TOTAL NATIONAL FEE =****\$894.00**Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). ☒**\$40.00****TOTAL FEES ENCLOSED =****\$934.00**

Amount to be refunded	\$
charged	\$

☒ A check in the amount of **\$934.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **50-0822** A duplicate copy of this sheet is enclosed.

**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

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NAME

37,729

REGISTRATION NUMBER

July 12, 2000

DATE

Express Mail Label No. EL 628755847US

534 Rec'd PCT/PTC 12 JUL 2000

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
PATENT COOPERATION TREATY**

Applicant:	Johann ENGELHARDT et al.	Group Art Unit:	unknown
Serial No.:	unknown	Examiner:	unknown
I.A. Filed:	14-January-1999	Attorney Ref.:	293.000218
I.A. No.:	PCT/DE99/00062		
Title:	OPTICAL ARRANGMENT IN THE ILLUMINATION BEAM PATH OF A MICROSCOPE		

PRELIMINARY AMENDMENT

Box PCT  
Commissioner for Patents  
Washington, D.C. 20231

Sir:

Please preliminarily amend the above-identified application, filed concurrently herewith under 35 U.S.C. § 371, as follows:

*IN THE SPECIFICATION:*

At page 1, line 2 (blank line), please insert:

--CROSS-REFERENCES TO RELATED APPLICATIONS

The present application is the U.S. national phase under 35 U.S.C. 371 of International Application No. PCT/DE99/00062 filed January 14, 1999 claiming priority of German Patent Application No. 198 01 833.9 filed January 14, 1998.

FIELD OF THE INVENTION--;

At page 1, line 5 (blank line), please insert the centered heading --BACKGROUND OF THE INVENTION--;

At page 2, line 10 (blank line), please insert the centered heading --SUMMARY OF THE INVENTION--;

At page 2, lines 16-17, please delete "the features of Claim 1. According to this,";

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At page 2, line 17, please delete "of this kind is";

At page 4, line 29, please delete "which follow Claim 1";

At page 5, line 4, please delete "The drawings show";

At page 5, line 5 (blank line), please insert:

--BRIEF DESCRIPTION OF THE DRAWINGS

The subject matter of the invention is described with reference to the embodiments shown in the drawings.--;

At page 5, line 23 (blank line), please insert the centered heading --DETAILED DESCRIPTION OF THE INVENTION--;

At page 6, after line 27, please insert the following new paragraph:

--The invention has been described in detail with particular reference to certain preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.--;

At page 8, line 1, please delete "**Patent Claims**" and insert --What is claimed is:--;

*IN THE CLAIMS:*

Please cancel claim 1-16 and add the following new claims 17-39:

--17. An optical arrangement in an illumination beam path of a confocal laser microscope, said optical arrangement comprising an illumination optical system arranged in said illumination beam path for modifying an illumination diameter of an illumination beam of said microscope.

19. The optical arrangement according to claim 17, wherein said illumination optical system includes a variable optical system for modifying said illumination diameter.

20. The optical arrangement according to claim 19, wherein said variable optical system operates steplessly for modifying said illumination diameter in a continuous manner.

21. The optical arrangement according to claim 20, wherein said variable optical system is a zoom optical system.

22. The optical arrangement according to claim 21, wherein said zoom optical system is motorized.

23. The optical arrangement according to claim 22, wherein said zoom optical system is a video camera zoom optical system.

24. The optical arrangement according to claim 17, wherein said microscope includes a plurality of predefined objectives selectively positionable in said illumination beam path, and said illumination optical system modifies said illumination diameter to match the entry pupil of a selected one of said plurality of objectives.

25. The optical arrangement according to claim 25, wherein said illumination optical system automatically modifies said illumination diameter.

33. The optical arrangement according to claim 32, wherein said illumination beam is variably expandable in accordance with the ratio of the focal length of said variable optical system to the focal length of said expanding optical system.

35. The optical arrangement according to claim 34, wherein said further optical component is an additional lens.

36. The optical arrangement according to claim 34, wherein said further optical component is an annular stop.

37. The optical arrangement according to claim 34, wherein said further optical component is a holographically generated optical element.

38. The optical arrangement according to claim 17, wherein a laser light beam from a further light source can be coupled in to said illumination beam path via an additional input and is adaptable to the entry pupil of the objective with no adaptation of the actual illumination beam path.

39. The optical arrangement according to claim 17, wherein said microscope is a multiphoton laser scanning microscope.--

Dated: July 12, 2000



534 Rec'd PCT/PT 1 2 JUL 2000

### Optical Arrangement in the Illumination Beam Path of a Microscope

This invention relates to an optical arrangement in the illumination beam path of a microscope, in particular of a confocal laser microscope.

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In confocal laser microscopy, it has for some time been part of the existing art to expand the laser beam (which of itself is Gaussian) in the illumination beam path, by way of a suitable optical system, in such a way that the entry pupil of the respective objective or objectives usable there is fundamentally overilluminated. The degree of overillumination is an important design parameter. Overillumination of the entry pupil on the one hand provides homogeneous illumination thereof, the purpose being to guarantee the theoretical resolution, in particular in the case of objectives having different apertures. On the other hand, especially in the case of objectives with a small entry pupil, overillumination of the entry pupil results in considerable losses of excitation light. Such losses of excitation light are, however, not acceptable in applications where performance reserves in the excitation light are low.

The Leica TCS laser scanning microscope, for example, in which a fixed expansion optical system is provided, has become known from practical use. The diameter of the laser beam expanded therein is approximately 25 mm ( $1/e^2$  value) at the microscope objective.

The divergence of the laser light and thus the illumination of the aperture that is effective for the excitation light can be controlled by modifying the size of the excitation pinhole. Reference is made in this context, solely by way of example, to G.J. Brakenhoff et al. in *Confocal Microscopy Handbook*, J. Pawley, ed., 1994, pp. 87-91.

A PL APO 40X/1.25 objective, for example, has an entry pupil approximately 12 mm in diameter. A PL APO 100X/1.4 objective, on the other hand, has an entry pupil only 5 mm in diameter. As a result, in the latter the excitation light is lost by a factor of  $(12/5)^2 = 5.76$  due to unnecessary overillumination.

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Even if the beam path before the excitation pinhole is otherwise unchanged, the pinhole transmission in proportion to the area of the pinhole is characterized by corresponding light losses at small diameters. This, too, is unacceptable for practical use.

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It is thus the object of the present invention to describe an optical arrangement in the illumination beam path of a microscope in which optimum illumination is guaranteed while reducing losses of excitation light.

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The optical arrangement of the generic type according to the present invention achieves the aforementioned object by way of the features of Claim 1. According to this, an optical arrangement of this kind is characterized by an illumination optical system, arranged in the illumination beam path, to modify the illumination diameter.

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According to the present invention, it has been recognized that the illumination diameter of the illumination beam should be more or less exactly adapted to the entry pupil of the objective in question in order to avoid light losses. Achieving this requires an illumination optical system, arranged in the illumination beam path, with which the illumination diameter can be modified or adapted. In this manner, light losses such as those of the existing art mentioned above can be at least largely avoided.

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Concretely, the illumination optical system provided according to the present invention could be embodied as an arrangement of replaceable fixed optics. When an

objective is replaced, the fixed optics in the illumination beam path would correspondingly need to be replaced, so that the illumination diameter is matched to the entry pupil of the respective objective.

5 In very particularly preferred fashion, the illumination optical system comprises a variable optical system, preferably operating steplessly, so that it is unnecessary to replace fixed optics in the illumination beam path. The variable optical system can be a preferably motorized zoom optical system, which in turn can be embodied as an ordinary zoom optical system such as is used, for example, in commercially available  
10 video cameras.

For simple and optimum adaptation of the illumination diameter to the entry pupils of multiple objectives, an automatic adjustment system could be provided. Concretely, the modification in the illumination diameter could be matched to the entry pupils of  
15 predefined objectives, preferably arranged in a revolving nosepiece, the modification or adaptation being accomplished automatically depending on the particular objective being used (corresponding to the position in the nosepiece).

In terms of concrete potential applications of the optical arrangement according to the present invention, it is conceivable for the illumination optical system to be arranged  
20 downstream from a point light source or an optical fiber. The illumination optical system could be embodied as a parallelizing optical system with a fixed focal intercept but variable focal length, the beam diameter being adaptable to the entry pupil of the objective.

25 It is also conceivable for the illumination optical system to be embodied as an expanding optical system for a preferably directly coupled-in laser beam. In this context the beam could be variably expandable in accordance with the ratio  $f_1/f_2$  of the focal lengths.

It has already been explained above by way of example that overillumination has been accepted in the existing art, especially when objectives have small entry pupils. The edge illumination in such cases, however, was certainly good. In order to promote edge illumination when an arrangement according to the present invention is used, it is advantageous, in particular with large entry pupils, if the illumination optical system comprises a further optical component that influences or favors edge illumination, the overillumination known from the existing art being avoided in any case. An optical component of this kind could be embodied as an additional lens, as an annular stop, or as a holographically generated optical element, the principal result thereof being that the ordinarily Gaussian laser beam is expanded in the edge regions. For example it would be possible thereby, especially in the case of confocal laser scanning microscopy, to achieve a constant intensity distribution over the entire entry pupil without causing substantial overillumination of the entry pupil of the objective. An intensity profile deviating therefrom may also be advantageous for a specific application.

It is furthermore conceivable to provide, in the case of the arrangement according to the present invention, an additional input for feeding in a further light source, this preferably involving the coupling-in of a laser light beam. With no modification of the actual illumination beam path, this laser light beam could be adaptable to the entry pupil of the objective, thus also making possible in this context an optimization of the laser light beam with no adaptation of the actual illumination beam path.

Lastly, an arrangement of the aforesaid kind could advantageously be used in multiphoton laser scanning microscopy or for multiphoton excitation.

There are various ways of advantageously embodying and developing the teaching of the present invention. Reference is made, for that purpose, on the one hand to the claims which follow Claim 1, and on the other hand to the explanation below of three

exemplary embodiments of the invention with reference to the drawings. In conjunction with the explanation of the preferred exemplary embodiments of the invention, a general explanation is also given of preferred embodiments and developments of the teaching. The drawings show

Fig 1 shows, in a schematic depiction, a first exemplary embodiment of an optical arrangement according to the present invention in the beam path of a confocal scanning microscope, a point light source being provided as the light source and the scanning microscope being depicted, for the sake of simplicity, merely schematically by way of its components;

Fig. 2 shows, in a schematic depiction, a second exemplary embodiment of an optical arrangement according to the present invention in the beam path of a confocal scanning microscope, an optical fiber being provided as the light source and the scanning microscope being depicted, for the sake of simplicity, merely schematically by way of its components; and

Fig. 3 shows, in a schematic depiction, a third exemplary embodiment of an optical arrangement according to the present invention in the beam path of a confocal scanning microscope, a laser light source or laser beam being provided as the light source and the scanning microscope being depicted, for the sake of simplicity, merely schematically by way of its components.

FIGS. 1 through 3 each show an optical arrangement in the illumination beam path 1 of a confocal scanning microscope, the scanning microscope as a whole being depicted merely schematically for the sake of simplicity.

While in FIG. 1 a point light source 2 is depicted (symbolically) as the light source, in FIG. 2 the light is coupled in via an optical fiber 3. In the exemplary embodiment in

FIG. 3, a laser beam 4 or a parallel light beam of an alternative/conventional light source is coupled via a lens 5 directly into illumination beam path 1.

According to the present invention, in all three exemplary embodiments (FIGS. 1, 2, and 3) an illumination optical system 6 is arranged in illumination beam path 1. This illumination optical system 6 serves to modify illumination diameter 7, thus making it possible for illumination diameter 7 to be adapted to the (symbolically depicted) entry pupil 8 of objective 9.

For better comprehension, the Figures show not only illumination beam path 1 as far as object 10, but also a scanner 12 and a beam combiner 11 arranged in illumination beam path 1.

A pinhole optical system 14 and a detection pinhole 15 (depicted schematically) are arranged in detection beam path 13.

In the exemplary embodiments depicted in FIGS. 1 and 2, illumination optical system 6 is embodied as a steplessly operating variable optical system. More precisely, in this case it is a motorized zoom optical system that, however, is shown merely symbolically by way of a shiftable lens 16. Concretely, what is being discussed here is an ordinary zoom optical system such as is known from video cameras.

In the embodiment depicted in FIG. 3, illumination optical system 6 is preceded by a lens 5 into which laser beam 4 is directly coupled.

To avoid repetition, reference is made to the general portion of the Specification regarding further features not evident from the Figures.

Table 1. Demographic characteristics of the study population	
Age (years)	50.0 ± 10.0
Gender	
Male	50.0%
Female	50.0%
Education (years)	12.0 ± 2.0
Occupation	
Professional	30.0%
Managerial	20.0%
Technical	10.0%
Service	20.0%
Unemployed	20.0%
Marital status	
Married	70.0%
Single	10.0%
Divorced	10.0%
Widowed	10.0%
Health status	
Good	80.0%
Fair	10.0%
Poor	10.0%
Smoking status	
Smoker	30.0%
Non-smoker	70.0%
Alcohol consumption	
Regular	10.0%
Occasional	20.0%
Never	70.0%
Family size	3.0 ± 1.0
Income (USD/month)	1000.0 ± 500.0
Health insurance	
Yes	90.0%
No	10.0%

	1	Illumination beam path
	2	Point light source
5	3	Optical fiber
	4	Laser beam
	5	Lens (downstream from the laser beam)
	6	Illumination optical system
	7	Illumination diameter
10	8	Entry pupil of the objective
	9	Objective
	10	Object
	11	Beam combiner
	12	Scanner
15	13	Detection beam path
	14	Pinhole optical system
	15	Detection pinhole
	16	Lens (of the illumination optical system)

### Patent Claims

1. An optical arrangement in the illumination beam path of a microscope, in particular of a confocal laser microscope, **characterized by** an illumination optical system, arranged in the illumination beam path, to modify the illumination diameter.
2. The arrangement as defined in Claim 1, **wherein** the illumination optical system is embodied as an arrangement of replaceable fixed optics.
3. The arrangement as defined in Claim 1, **wherein** the illumination optical system comprises a variable optical system, preferably operating steplessly.
4. The arrangement as defined in Claim 3, **wherein** the variable optical system is a preferably motorized zoom optical system.
5. The arrangement as defined in Claim 4, **wherein** the zoom optical system is a zoom optical system usual in video cameras.
6. The arrangement as defined in one of Claims 1 through 5, **wherein** the modification in the illumination diameter is matched to the entry pupils of predefined objectives, preferably arranged in a revolving nosepiece, and preferably is accomplished automatically.
7. The arrangement as defined in one of Claims 2 through 6, **wherein** the illumination optical system is arranged downstream from a point light source or an optical fiber (3).



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14. The arrangement as defined in Claim 11, **wherein** the further optical component is embodied as a holographically generated optical element.

- 5

16. The use of an arrangement as defined in one of Claims 1 through 15 in multiphoton laser scanning microscopy.

Figure 1 consists of 15 bar charts, labeled (a) through (o), each representing a different fish species. The y-axis for all charts is 'Percentage of total catch' ranging from 0 to 100. The x-axis for all charts represents months from January to December. The data is as follows:

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(a) Atlantic croaker	10	15	20	25	30	35	40	45	50	55	60	65
(b) Atlantic menhaden	10	15	20	25	30	35	40	45	50	55	60	65
(c) Atlantic herring	10	15	20	25	30	35	40	45	50	55	60	65
(d) Atlantic bluefish	10	15	20	25	30	35	40	45	50	55	60	65
(e) Atlantic silverside	10	15	20	25	30	35	40	45	50	55	60	65
(f) Atlantic tomcod	10	15	20	25	30	35	40	45	50	55	60	65
(g) Atlantic sand lance	10	15	20	25	30	35	40	45	50	55	60	65
(h) Atlantic mummichog	10	15	20	25	30	35	40	45	50	55	60	65
(i) Atlantic killifish	10	15	20	25	30	35	40	45	50	55	60	65
(j) Atlantic darter	10	15	20	25	30	35	40	45	50	55	60	65
(k) Atlantic rockfish	10	15	20	25	30	35	40	45	50	55	60	65
(l) Atlantic sea bream	10	15	20	25	30	35	40	45	50	55	60	65
(m) Atlantic sea bass	10	15	20	25	30	35	40	45	50	55	60	65
(n) Atlantic sea perch	10	15	20	25	30	35	40	45	50	55	60	65
(o) Atlantic sea catfish	10	15	20	25	30	35	40	45	50	55	60	65

## 5

An optical arrangement in the illumination beam path (1) of a microscope, in particular of a confocal laser microscope, is characterized, for optimum illumination while reducing losses of excitation light, by an illumination optical system (6), arranged in the illumination beam path (1), to modify the illumination diameter (7).

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Parameter	Value	Unit
Initial concentration	1.0	g/L
Initial pH	7.0	
Temperature	25.0	°C
Time	0.0	h
Time	1.0	h
Time	2.0	h
Time	3.0	h
Time	4.0	h
Time	5.0	h
Time	6.0	h
Time	7.0	h
Time	8.0	h
Time	9.0	h
Time	10.0	h
Time	11.0	h
Time	12.0	h
Time	13.0	h
Time	14.0	h
Time	15.0	h
Time	16.0	h
Time	17.0	h
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Time	19.0	h
Time	20.0	h
Time	21.0	h
Time	22.0	h
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Time	87.0	h
Time	88.0	h
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Time	90.0	h
Time	91.0	h
Time	92.0	h
Time	93.0	h
Time	94.0	h
Time	95.0	h
Time	96.0	h
Time	97.0	h
Time	98.0	h
Time	99.0	h
Time	100.0	h

Fig. 1

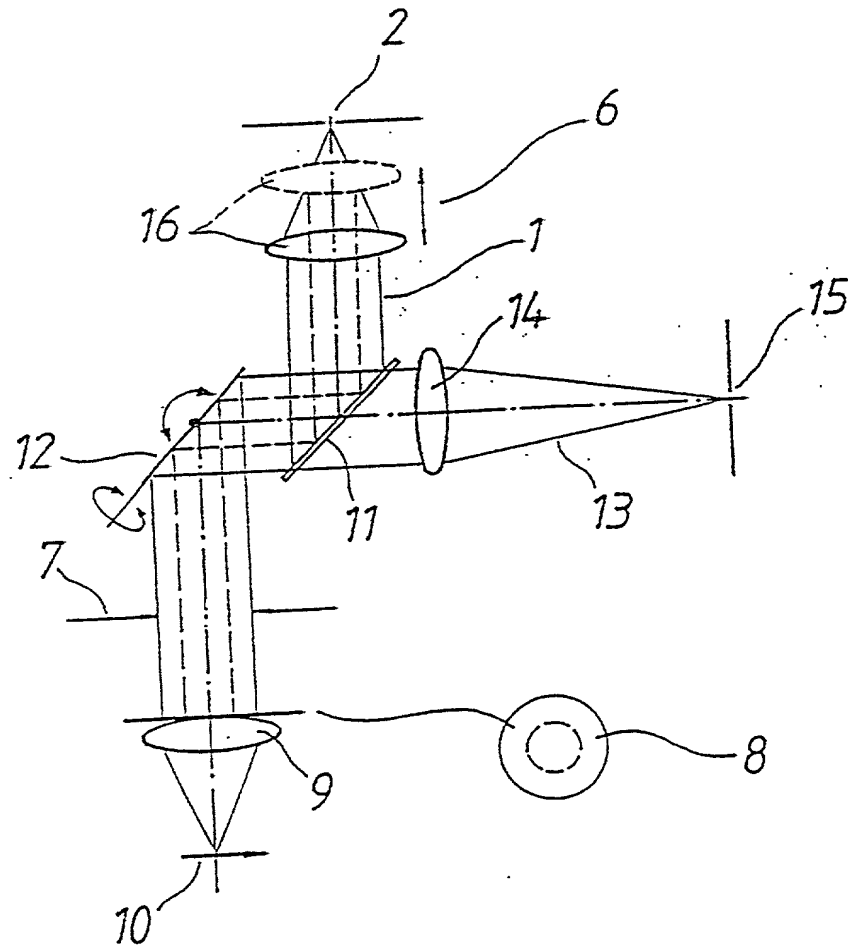


Fig.2

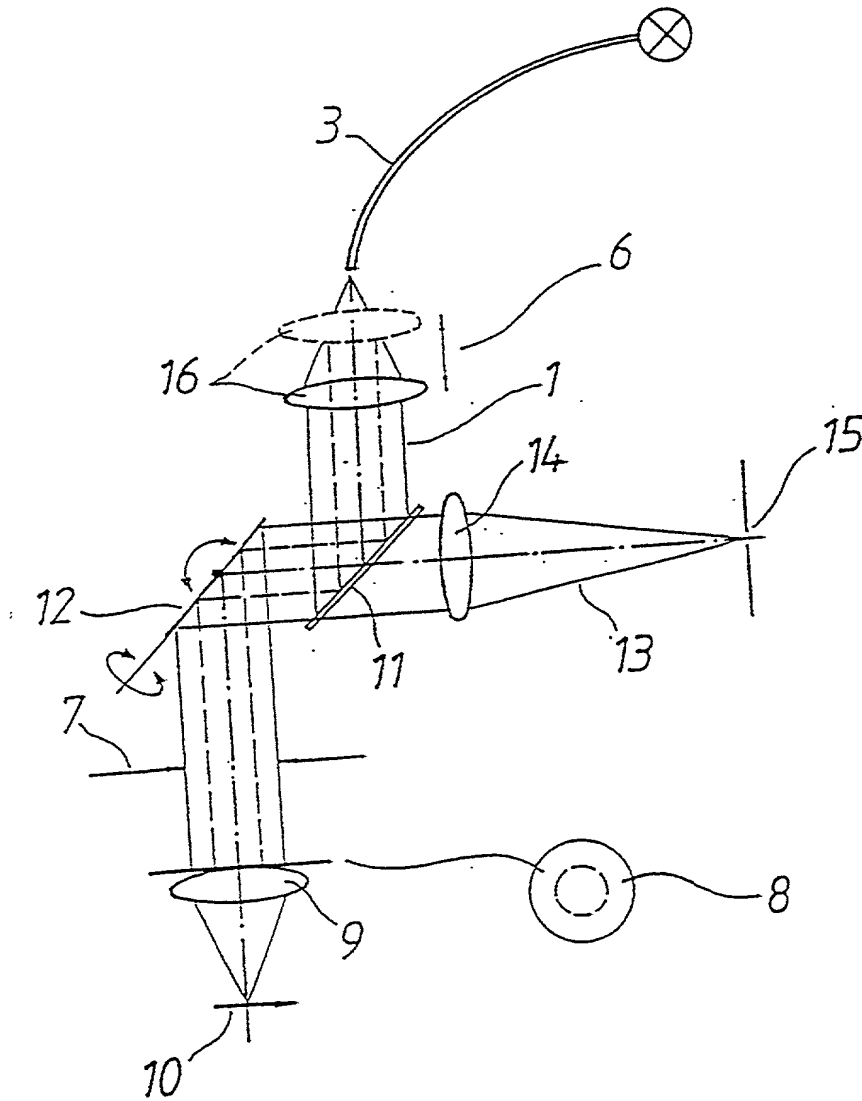
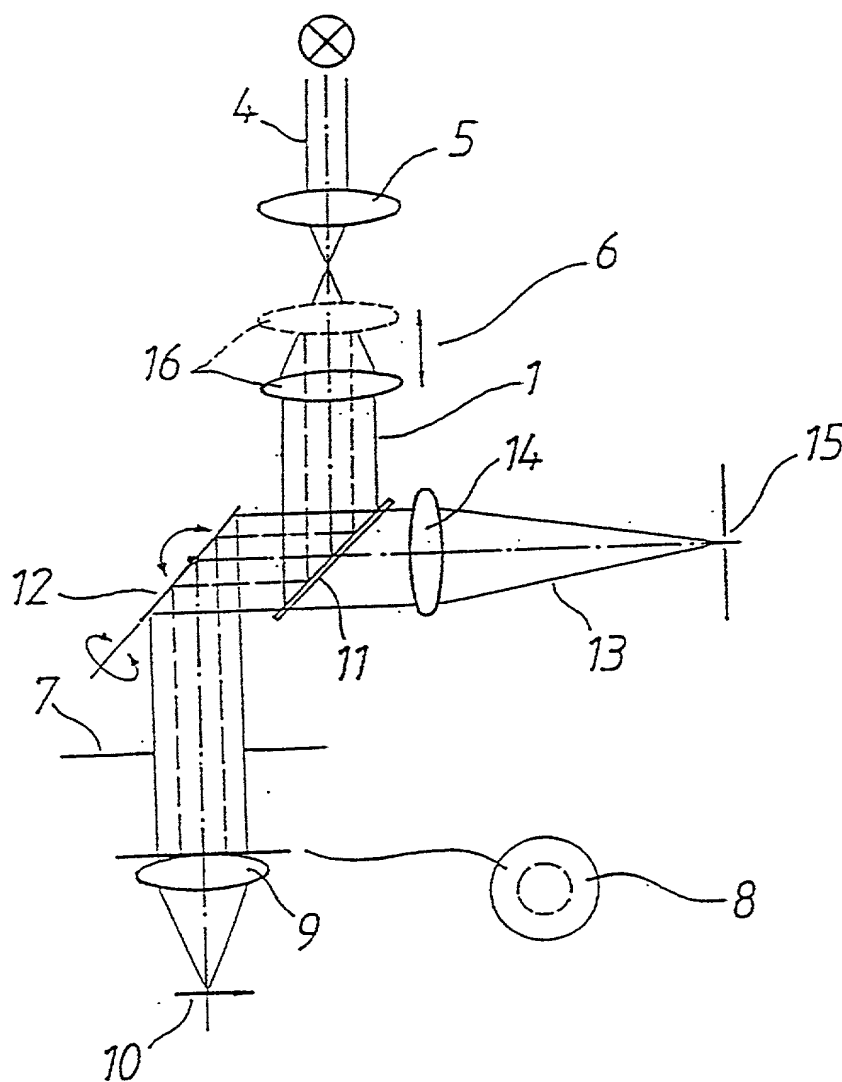


Fig. 3



**Declaration and Power of Attorney for Patent Application**  
**Erklärung für Patentanmeldungen mit Vollmacht**  
**German Language Declaration**

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

daß mein Wohnsitz meine Postanschrift und meine Staatsangehörigkeit den im nachstehenden nach meinem Namen aufgeführten Angaben entsprechen, daß ich nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent für die Erfindung mit folgendem Titel beantragt wird:

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deren Beschreibung hier beigefügt ist, es sei denn (in diesem Falle Zutreffendes bitte ankreuzen), diese Erfindung

☒ wurde angemeldet am 14 Januar 1998 unter der US-Anmeldenummer oder unter der Internationalen Anmeldenummer im Rahmen des Vertrags über die Zusammenarbeit auf dem Gebiet des Patentwesens (PCT) PCT/DE99/00062 und am \_\_\_\_\_ abgeändert (falls zutreffend).

Ich bestätige hiermit, daß ich den Inhalt der oben angegebenen Patentanmeldung, einschließlich der Ansprüche, die eventuell durch einen oben erwähnten Zusatzantrag abgeändert wurde, durchgesehen und verstanden habe.

Ich erkenne meine Pflicht zur Offenbarung jeglicher Informationen an, die zur Prüfung der Patentfähigkeit in Einklang mit Titel 37, Code of Federal Regulations, § 1.56 von Belang sind.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäß Title 35, US Code, § 119(a)-(d), bzw. § 365(b) aller unten aufgeführten Auslandsanmeldungen für Patente oder Erfinderurkunden, oder § 365(a) aller PCT internationalen Anmeldungen, welche wenigstens ein Land ausser den Vereinigten Staaten von Amerika benennen, und habe nachstehend durch ankreuzen sämtliche Auslandsanmeldungen für Patente bzw. Erfinderurkunden oder PCT internationale Anmeldungen angegeben, deren Anmeldetag dem der Anmeldung, für welche Priorität beansprucht wird, vorangeht.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

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the specification of which is attached hereto unless the following box is checked:

☒ was filed on January 14, 1999 as United States Application Number or PCT International Application Number PCT/DE99/00062 and was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Applications  
(Frühere ausländische Anmeldungen)

198 01 833.9      Germany      14/January/1998

App. No.      Country      Day/Month/Year

App. No.      Country      Day/Month/Year

Ich beanspruche hiermit Prioritätsvorteile unter Title 35, US Code, § 119(e) aller US-Hilfsanmeldungen wie unten aufgezählt.

App. No.      Filed:

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Ich beanspruche hiermit die mir unter Title 35, US Code, § 120 zustehenden Vorteile aller unten aufgeführten US-Patentanmeldungen bzw. § 365(c) aller PCT internationalen Anmeldungen, welche die Vereinigten Staaten von Amerika benennen, und erkenne, insofern der Gegenstand eines jeden früheren Anspruchs dieser Patentanmeldung nicht in einer US-Patentanmeldung, bzw. PCT internationalen Anmeldung in in einer gemäß dem ersten Absatz von Title 35, US-Code, § 112 vorgeschriebenen Art und Weise offenbart wurde, meine Pflicht zur Offenbarung jeglicher Informationen an, die zur Prüfung der Patentsfähigkeit in Einklang mit Title 37, Code of Federal Regulations, § 1.56 von Belang sind und die im Zeitraum zwischen dem Anmeldetag der früheren Patentanmeldung und dem nationalen oder im Rahmen des Vertrags über die Zusammenarbeit auf dem Gebiet des Patentwesens (PCT) gültigen internationalen Anmeldetags bekannt geworden sind.

App. No.      Filed:

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Ich erkläre hiermit, daß alle in der vorliegenden Erklärung von mir gemachten Angaben nach bestem Wissen und Gewissen der Wahrheit entsprechen, und ferner daß ich diese eidesstattliche Erklärung in Kenntnis dessen ablege, daß wissentlich und vorsätzlich falsche Angaben oder dergleichen gemäß § 1001, Title 18 des US-Code strafbar sind und mit Geldstrafe und/oder Gefängnis bestraft werden können und daß derartige wissentlich und vorsätzlich falsche Angaben die Rechtswirksamkeit der vorliegenden Patentanmeldung oder eines aufgrund deren erteilten Patentes gefährden können.

VERTRETUNGSVOLMACHT: Als benannter Erfinder beauftrage ich hiermit den (die) nachstehend aufgeführten Patentanwalt (Patentanwälte) und/oder Vertreter mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Angelegenheiten vor dem US-Patent- und Markenamt: (Name(n) und Registrationsnummer(n) auflisten)

Priority Not Claimed  
(Priorität nicht beansprucht)

☐

☐

☐

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

Status: Patented/Pending/Abandoned

Status: Patented/Pending/Abandoned

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number)



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